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REMARKS

Restriction Requirement

1. The Examiner's Restriction Requirement is hereby acknowledged and the Applicant makes a provisional election without traverse to prosecute the invention of Group I, Claims 1-7 and 11-19 drawn to a system. This Office Action Response includes cancellation of the non-elected Claims as required by the Examiner.

Specification Objection

2. The Examiner's specification objection with regards to Claim 6 has been studied and Claim 6 has been amended to overcome the objection.

Claim Objections

3. The Examiner's Claim objections have been studied and Claim 3 has been amended to overcome the Claim objection.

Claim Rejections - 35 USC §112

4. The Examiner's rejection of Claim 2 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention has been studied and the Applicant has amended Claim 2 to overcome the ambiguity cited by the Examiner.

Claim Rejections - 35 USC §102(b)

5. The Examiner's rejection of Claims 1-7, 11-12, and 14-19 under 35 U.S.C. 102(b) as being anticipated by US Patent 5,988,975 to Pizzi (Pizzi) has been studied and the Applicant

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respectfully disagrees with the Examiner's rejection. Claim 1 of the Application, from which Claims 2-5 and 7 depend includes the following elements not disclosed in Pizzi.

Claim 1 is a gas turbine engine, which includes at least two bolted together annular flanges extending from a turbine casing; and

- b) a continuous annular heat shield, which
 - i) encapsulates the annular flanges, and
 - ii) includes bellows or diaphragms which reduce the axial modulus of elasticity of the heat shield.

The Applicant respectfully submits that Pizzi does not disclose two or more bolted together annular flanges, does not disclose a continuous annular heat shield, which encapsulates the annular flanges, and does not disclose bellows or diaphragms which reduce the axial modulus of elasticity of the heat shield.

The Examiner incorrectly stated that Pizzi teaches "a continuous annular heat shield (12), which encapsulates the annular flange". The element (12) in Pizzi is a shroud not a heat shield and it clearly does not encapsulate the annular flanges as can be seen in FIG. 4 of Pizzi. Furthermore, the shroud is in contact with both the hook and the support structure 36 in the vicinity of the flange (20) in Pizzi which is counter to it functioning as a heat shield.

The Examiner incorrectly stated that Pizzi teaches "bellows or diaphragms (25) which reduce the axial modulus of elasticity of the heat shield". Element 25 in Pizzi is clearly not a bellows or diaphragm as clearly seen in FIG. 1. Referring to column 3, lines 37-46, Pizzi clearly points out 25 is a member of a seal 24, "The seal 24 is made up of a sheet 24 of heat

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resistant alloy which has been bent to provide upstanding elements 28 and 30 and horizontal members 25 and 27 which correspond with the platform 14." The seal 24 sits in continuous grooves 26 in the end walls of the shroud segments 12. Thus, neither the seal 24 nor the member 25 of the seal can function as a "bellows or diaphragms (25) which reduce the axial modulus of elasticity of the heat shield" because the seal 24 is free to slide or move within the grooves and offers no resistance to circumferential expansion or contraction of the shroud segments (12) in Pizzi.

As regards Claim 2, the Examiner incorrectly stated that Pizzi teaches "the annular heat shield is impervious to gas flow (col 1 lines 21-26 and col 2 lines 4-8), except possibly at the base edges". In fact, it teaches exactly the opposite. Pizzi clearly teaches to flow air through the shroud segments 12 as clearly stated in column 3, lines 32-37, "Ventilation openings 31 are also provided in the support structure 36 to allow this cool air to enter annular channel 35 formed between the shroud 12 and support structure 36. Finally, apertures 37 in the shroud 12 allow this cooling air to exhaust into the hot gas path." Clearly, Pizzi does not disclose nor teach an annular heat shield that is impervious to gas flow.

As regards Claim 3, the Examiner has not pointed out the following elements of Claim 3, a hollow section (of the seal) surrounding a second sector of the flange. Sectors are annular sections of an annular element. The only annular sections in Pizzi are the shroud segments (12) and they are all exactly alike. Pizzi does not disclose a single bulkhead lying in an axial plane and separated from the second sector by a blanket of air wherein the bulkhead connects the mounting section with the hollow section. The Examiner by merely stating the conclusion

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without pointing out the elements in Pizzi and, thus, has failed to show that Pizzi discloses these elements of Claim 3.

As regards Claim 4, the Examiner states that has not pointed out the following elements of Claim 3, a hollow section (of the seal) surrounding a second sector of the flange. Sectors are annular sections of an annular element. The only annular sections in Pizzi are the shroud segments (12) and they are all exactly alike. Pizzi does not disclose a single bulkhead lying in an axial plane and separated from the second sector by a blanket of air wherein the bulkhead connects the mounting section with the hollow section. The Examiner by merely stating the conclusion without pointing out the elements in Pizzi has failed to show these elements of Claim 3. Thus, since the Examiner has failed to point out different mounting and hollow sections he is incorrect in stating that Pizzi discloses U-shaped cross section of the mounting sections.

As regards Claim 5, as clearly proven above, contrary to the Examiner's conclusion, Pizzi does not disclose a single bulkhead lying in an axial plane and separated from the second sector by a blanket of air wherein the bulkhead connects the mounting section with the hollow section. The Examiner is incorrect in stating that Pizzi teaches bulkheads that flex during thermal expansion or contraction of the annular heat shield. Pizzi, in col. 3, lines 48-59, discloses a seal not a bulkhead and the seal slides in the groove as explained above.

As regards Claim 6, the Applicant has amended Claim 6.

As regards Claim 7, the Applicant has proven above that Pizzi does not disclose two or more bolted together annular flanges and does not disclose a continuous annular heat shield, which encapsulates the annular flanges. Furthermore, the Examiner is incorrect in stating that because the heat shield is

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segmented so that each segment deforms independently of the next that the modulus of elasticity of the entire heat shield would be lower. The segments of the flange in Pizzi which are actually shroud segments 12 and the modulus of elasticity of each of these segments is dependent on the material and shape and size of the segment.

As regards Claims 11 and 12, the Applicant has shown above that Pizzi does not disclose two or more bolted together flanges. Furthermore, Pizzi does not disclose or teach an annular heat shield constructed of a sequence of hollow units wherein each unit surrounds a sector of the flange, and each unit includes a first housing which surrounds a first sector of the flange, and a second housing which surrounds a second sector of the flange to define an air space between the second housing with the second sector. The segments 12 that the Examiner pointed out are not first and second housings but rather just first shroud segments. Thus, according to the Examiner's interpretation of the drawings in Pizzi, the shroud segments are housings for the flange (forward hook according to the Examiner) extending from the shroud. This cannot be possible and the shroud cannot do double duty as the flange and the housing surrounding the flange. Furthermore, as shown above, the shroud 12 cannot be a heat shield.

As regards Claims 14, 15 and 17, the Applicant has shown above that Pizzi does not disclose two or more bolted together flanges or a bellows or a diaphragm (25). The Examiner incorrectly stated that Pizzi teaches "bellows or diaphragms (25) which reduce the axial modulus of elasticity of the heat shield". Element 25 in Pizzi is clearly not a bellows or diaphragm as clearly seen in FIG. 1. Referring to column 3, lines 37-46, Pizzi clearly points out 25 is a member of a seal 24. "The seal

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24 is made up of a sheet 24 of heat resistant alloy which has been bent to provide upstanding elements 28 and 30 and horizontal members 25 and 27 which correspond with the platform 14." The seal 24 sits in continuous grooves 26 in the end walls of the shroud segments 12. Thus, neither the seal 24 nor the member 25 of the seal can function as a "bellows or diaphragms (25) which reduce the axial modulus of elasticity of the heat shield" because the seal 24 is free to slide or move within the grooves and offers no resistance to circumferential expansion or contraction of the shroud segments (12) in Pizzi.

As regards Claim 16, the Applicant has amended Claim 16.

As regards Claims 18 and 19, the Applicant has canceled Claims 18 and 19.

Thus, the Applicant respectfully submits that the amendments and remarks above overcome the Examiner's rejection of Claims 1-7, 11-12, and 14-19 under 35 U.S.C. 102(b) as being anticipated by US Patent 5,988,975 to Pizzi (Pizzi) and respectfully requests reconsideration and allowance of Claims 1-7, 11-12, and 14-17.

Claim Rejections - 35 USC §103(a)

6. The Examiner's rejection of Claim 13 under 35 U.S.C. 103(a) as being unpatentable over US Patent 5,988,975 to Pizzi (Pizzi) in view of US Patent 6,435,820 to Overberg (Overberg), has been studied and the Applicant respectfully disagrees with the Examiner's reasons for the 103 rejection. The Applicant respectfully submits that with regards to the independent Claim 11 from which Claim 13 depends, the Applicant has shown above that Pizzi does not disclose two or more bolted together flanges. Furthermore, Pizzi does not disclose or teach an annular heat

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shield constructed of a sequence of hollow units wherein each unit surrounds a sector of the flange, and each unit includes a first housing which surrounds a first sector of the flange, and a second housing which surrounds a second sector of the flange to define an air space between the second housing with the second sector. The segments 12 that the Examiner pointed out are not first and second housings but rather just first shroud segments. Thus, according to the Examiner's interpretation of the drawings in Pizzi, the shroud segments are housings for the flange (forward hook according to the Examiner) extending from the shroud. This cannot be possible and the shroud cannot do double duty as the flange and the housing surrounding the flange. Furthermore, as shown above, the shroud 12 cannot be a heat shield.

The Examiner stated that "Overberg teaches a gas turbine shroud that is bolted (144 and 164) into a shroud support case (116) in order to attach the shrouds to the support case. In addition, it is well known in the art to use "anti-rotation" pins that extend through the casing and heat shields to keep the heat shields from rotating circumferentially. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the bolts of Overberg or the anti-rotation pins in the heat shield of Pizzi in order to attach the heat shields to the casing and to keep the heat shields from rotating circumferentially." The Applicant disagrees with this statement by the Examiner. It has never been shown by the Examiner that it is well known in the art to use "anti-rotation" pins that extend through the casing and heat shields to keep the heat shields from rotating circumferentially. Furthermore, the Examiner has confused turbine shrouds with heatshields. Thus, the Examiner has failed to show that it would have been obvious to one of

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ordinary skill in the art at the time of the invention to use the bolts of Overberg or the anti-rotation pins in the heat shield of Pizzi in order to attach the heat shields to the casing and to keep the heat shields from rotating circumferentially. The Applicant respectfully requests reconsideration and allowance of Claim 13.

7. The Applicant respectfully submit that all of the Specification and Claim Objections have been overcome by the respective Amendments above and that the Claim rejections under 35 U.S.C. §112, §102(b), and §103(a) have been traversed by the amendments and remarks above and request reconsideration and allowance for Claims 1-7 and 11-17 and request that these Claims be passed on to issue.

Respectfully submitted,



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